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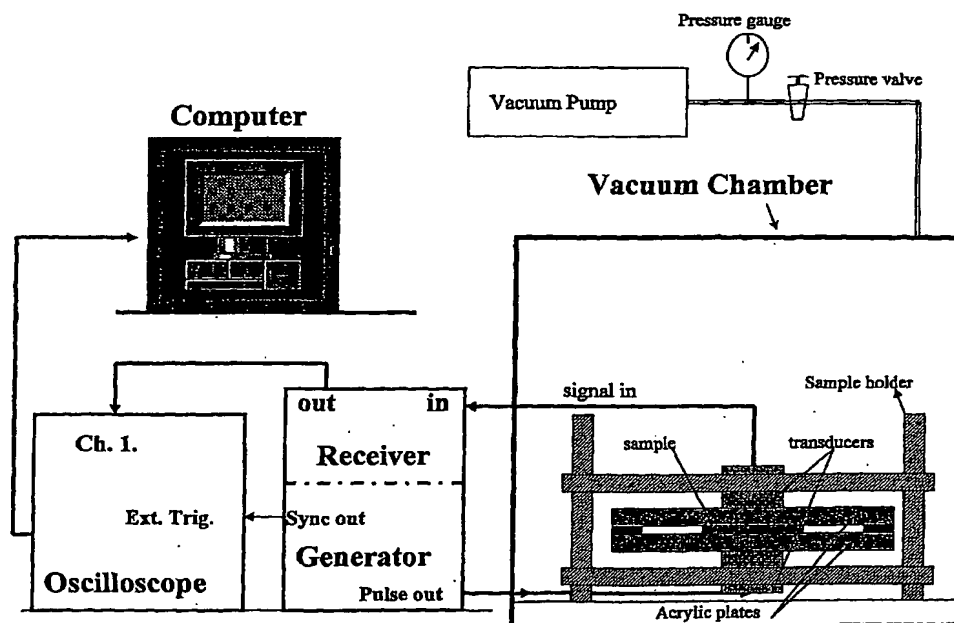
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GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

[Continued on next page]

(54) Title: ULTRASONIC EVALUATION OF THE STRENGTH OF FLOUR DOUGHS



(57) Abstract: A method of determining dough strength and predicting dough quality is herein described. The method involves propagating an ultrasound signal through a sample of dough and determining the transit time and amplitude of the ultrasound signal, and hence the ultrasonic velocity and attenuation. These data are then used to determine dough strength and predict product quality. Measurement of dough expansion by digital photography as pressure is varied provides complementary information that is used to determine dough strength and predict product quality.

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**Published:**

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

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# INTERNATIONAL SEARCH REPORT

International Application No  
PCT/CA 03/01249

A. CLASSIFICATION OF SUBJECT MATTER  
IPC 7 G01N29/18 G01N29/20 G01H5/00 G01N33/10 G01K11/00

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 G01N G01H G01K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, BIOSIS, COMPENDEX, INSPEC, WPI Data

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	LEE H. O., LUAN H., DAUT D.G.: "Use of an Ultrasonic Technique to Evaluate the Rheological Properties of Cheese and Dough" J. FOOD ENG., vol. 16, 1992, pages 127-150, XP009033296 cited in the application	1-9,32
Y	abstract	5
A	page 134, last paragraph - page 148, paragraph 1 ----- -/--	10-14, 25-31

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

### \* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

8 July 2004

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## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	LETANG, C., PIAU M., VERDIER C.: "Caractérisation ultrasonore et propriétés rhéologiques de mélanges farine eau" CAHIERS DE RHEOLOGIE, vol. 15, no. 1, 1996, pages 319-326, XP009033336 cited in the application the whole document	1-4,6-9, 32
Y A	----- DATABASE WPI Section Ch, Week 199114 Derwent Publications Ltd., London, GB; Class D11, AN 1991-099773 XP002287562 MAZHONAS A. R., PYATAUSKA A. I., YUODEIKENE G. F.: & SU 1 552 099 A (KAUNASSK POLT INST ANTANASA) 23 March 1990 (1990-03-23) abstract	5 10-14, 25-31
Y	----- DE 197 25 012 C (BROSE FAHRZEUGTEILE) 5 November 1998 (1998-11-05) abstract; claim 1; figures 1a-1j,4.3,4.6 column 1, line 3 - column 15, line 15 column 21, line 44 - column 22, line 18 -----	5
A		1,10,25
A		1,10

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/CA 03/01249

## Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:  
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

see annex

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-14, 25-31,32 (part)

Ultrasonic transmission measurements are performed at different temperatures and the dough quality is predicted based on the ultrasonic velocity and attenuation of the ultrasound signal measured at the different temperatures.

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2. claims: 15-19

Transit time and the amplitude of the ultrasound signal are determined in dough samples with different thicknesses and the dough quality is predicted based on the thickness dependence of the ultrasound signal.

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3. claims: 20-24,32(part)

Determination of fermentation response of the dough based on the change in ultrasonic velocity and attenuation of the ultrasound signal measured at different times.

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4. claims: 33,34

The dough quality is determined by measuring the cross-sectional change in a receptacle having a given thickness after application of different external pressures and predicting dough quality based on the true strain versus stress.

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# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

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Patent document cited in search report		Publication date	Patent family member(s)	Publication date
SU 1552099	A	23-03-1990	SU 1552099 A1	23-03-1990
			LT 2465 R3	15-02-1994
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